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Identification of complicated carotid plaques by adding functional fluorodeoxyglucose-positron emission tomographic imaging to morphological characteristics on computed tomographic angiography

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Aim We developed a simple semi-quantitative score for the analysis of carotid plaques with FDG-PET-CTA imaging and tested whether adding functional imaging criteria extracted from FDG-PET imaging to morphological plaque characteristics identified with CTA might improve the detection of complicated plaques.

Material and Methods Twenty-eight patients scheduled for carotid endarterectomy were imaged with PET after injection of FDG followed by CTA of the supra-aortic trunks. Morphological aspects of plaques identified with CTA and metabolic activity quantified with FDG-PET (Tissue to Background ratio, TBR) were measured in the carotid segment with the highest degree of luminal stenosis and graded using semi-quantitative CT and PET scores. Combined score was calculated for each carotid artery by summing CT and PET scores. After carotid endarterectomy, vascular surgeons classified carotid plaques macroscopically as complicated or non-complicated.

Results Twenty-eight carotid arteries were operated in 26 patients (24 symptomatic patients). Sixteen plaques were classified macroscopically as complicated. CTA detected hypodense regions and ulcerations in 81% and 25%, of complicated plaques, and in 33% and 0% of non-complicated plaques, respectively. Hypodense areas on CTA identified complicated plaques with a sensitivity of 87% and a specificity of 67%. Mean TBR with FDG-PET was measured at 2.2±0.4 in complicated plaques and 1.9±0.3 in non-complicated plaques ($p<0.05$). Values for the semi-quantitative score based on plaques characteristics with CTA and FDG-PET were 5.4±1.7 in complicated plaques and 2.5±2.4 in non-complicated plaques ($p<0.05$). A combined PET-CT score ≥3 identified complicated plaques with a sensitivity of 100% and a specificity of 67%.

Conclusions Adding FDG-PET imaging criteria to morphological characteristics of plaques on CTA improved the sensitivity of the detection of complicated carotid plaques.

The author hereby declares no conflict of interest

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Screening of the aneurysm of the abdominal aorta during the echocardiography: experience of an Algerian center

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Background An abddominal aortic aneurysm (AAA) is potentially fatal when ruptured.Wheras the transthoracic echocardiography (TTE) protocol does not routinely include examination of the infra renal andominal aorta, the protocol is performed quickly and easily for AAA screening.The main aim of this study is to analyze the utility of transthoracic echocardiography in the study of infrarenal aorta and AAA sreening in selected popultion.

Methods The study included 674 patients (452 men, 222 women) consecutively assessed by TTE and, where possible, abdominal ulrasound for any reason in a cardiology department.

Results An AAA was detected in 31 patients (6.4%). The mean age of AAA patients was 72 years old.29 patients of whom were male.The presence of AAA was associated with male gender and older age and smoking.In this study makes it possible to popose a surgical act among 6 patients after the discovery of an aneurysm diameter more than 55mm.

Conclusions Screening of AAA during TTE is easy and feasible.Detection of asymtomatic AAA may save lives.Therefore, opportunistic examination of the abdominal aorta during routine TTE, which involves little time and cost, would appear to be effective, at least in patients over 60 years of age, especially in men.

The author hereby declares no conflict of interest

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Course of vascular obstruction after pulmonary embolism as assessed by ventilation-perfusion lung scan follow-up

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Background We investigated the course of residual pulmonary vascular obstruction (RPVO) from discharge up to 3 – 6 months after pulmonary embolism (PE).

Methods Prospective registry including 202 consecutive patients with PE who survived the acute phase (high risk PE: 12.4%, intermediate-risk: 65.8%, and low- risk: 21.8%). Patients with a prior history of chronic pulmonary disease were excluded. Ventilation-perfusion (V/Q) lung scan was performed in all patients before discharge, and again at follow-up (between 3 and 6 months after discharge). Treatment was in accordance with current guidelines. Evolution of RPVO was determined as the relative change in lung perfusion (in %) between discharge and follow-up V/Q scans.

Results Between both lung scans, RPVO decreased from 29.1±15% to 10.9±11.4%, with an average relative change of 61.7±33.4%. Overall, 49 patients (24.2%) presented a full resolution of lung perfusion. Relative change in RPVO was <50% in57 (28%), including 18 (8.9%) patients who showed no modification on lung scan. The relative change in RPVO was constant, regardless of the level of RPVO at discharge ($p=0.07$). Patients who presented full resolution on the second lung scan (n=49) had significantly lower RPVO at discharge as compared to those without full resolution (21.7±10.1% vs. 31.4±16.0% respectively, $p<0.001$), and almost 75% of those with full resolution had RPVO<30% at discharge. Multivariate logistic regression showed that high-risk PE and right ventricle (RV) to left ventricle (LV) ratio (by quartiles) at discharge were independently related to unfavorable course of RPVO during follow-up (high-risk PE: OR 3.6, 95% CI 1.54-8.43,$p<0.001$; RV/LV ratio: OR 3.42, 95% CI 1.12-9.45, $p=0.03$).

Conclusion Our findings suggest that systematic lung scan follow-up should not be considered after PE, except in patients with high-risk PE or those with echocardiographic signs of RV pressure overload at discharge.

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Impact of diabetes and hypertension on the longitudinal systolic function of the left ventricle

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Introduction Hypertension is responsible for many structural changes with myocardial fibrosis leading to left ventricular hypertrophy and progressive deterioration over time of systolic left ventricular and diastolic function. Hypertension and type 2 diabetes are major causes of ventricular dysfunction and heart failure risk factors. Current data suggest that the longitudinal LV systolic dysfunction was found in the early stages of hypertensive cardiomyopathy. Recently, the development of the imaging (2D) strain has facilitated simple and independent measurement of LV strain parameters in the longitudinal, circumferential and radial.

Materials and methods This work is to achieve in a series of 30 hypertensive patients with diabetes and 30 non diabetic hypertensive patients (aged 25-75 years) a complete echo cardiographic study, including LVEF biplane Simpson method, calculation of left ventricular mass indexed and the relative thickness parietal to differentiate the eccentric and concentric left ventricular

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